

4.0 SUMMARY

The USACE implements an annual monitoring program at Beltzville Reservoir to evaluate lake water quality and potential public health concerns. In general, the monitoring programs emphasize measuring water quality and sediment contamination. Monitoring results are compared to state and federal criteria to evaluate the condition of Beltzville Reservoir. The 2001 monitoring program of Beltzville Reservoir comprised four major elements:

- water quality of physical/chemical parameters at fixed stations from April through October;
- monthly water quality monitoring of nutrient parameter concentrations and bacteria contamination from April to October;
- sediment priority pollutant monitoring for semivolatile organic compounds and metals at a fixed station in the deepest part of the reservoir; and
- drinking water monitoring of the public water fountain in the overlook building.

4.1 WATER QUALITY MONITORING

Surface and downstream water quality were in compliance with state standards for dissolved oxygen concentrations (minimum of 5 mg/L). Dissolved oxygen in the lower water column of the deeper portions of the reservoir was below standards during September and October. Measures of pH throughout the water column of the reservoir met the conditions of the water quality standard. Beltzville Reservoir contained acceptable levels of nutrients during 2001. Ammonia, nitrate + nitrite, TDS, and alkalinity were in compliance with state water quality standards throughout the reservoir watershed. Organic contamination in the reservoir was relatively low during 2001. Concentrations of toluene, o-xylene and m,p-xylenes were rarely measured above detection limits throughout the monitoring period.

The trophic status of Beltzville Reservoir was defined, independently, Carlson's trophic state indices and EPA criteria. Carlson's trophic state indices indicated the reservoir to be in mesotrophic condition during 2001. EPA criteria indicated the reservoir to be in oligotrophic/mesotrophic condition during 2001.

Beltzville Reservoir was in compliance with the PADEP water quality standard for bacteria contamination during 2001. The geometric means among samples collected each month were always less than 200 colonies/100-ml. Ratios of fecal coliform to fecal streptococcus counts were ambiguous and did not appear to identify a source of bacteria contamination.

4.2 SEDIMENT PRIORITY POLLUTANT MONITORING

Beltzville Reservoir was in compliance with NJDEP soil guidelines in 2001. Concentrations of metals and semivolatile organic compounds were less than screening guidelines.

4.3 MONITORING PROGRAM TRENDS

Analysis of long-term downstream and reservoir trends suggested that few water quality changes have occurred in Beltzville Reservoir over the past 26 years.

Trends computed for individual stations using the Mann-Kendall test indicated significant water quality changes at several locations in the Beltzville Reservoir watershed. Ammonia appears to be decreasing at most stations throughout the reservoir and downstream in both seasons. Total phosphorus was decreasing only at station BZ-4 in summer. TDS was decreasing at station BZ-3 in both seasons, and at stations BZ-4 and BZ-5 in the summer. Additionally, TDS was increasing at station BZ-6 in the spring. BOD was decreasing in the summer at station BZ-1, downstream of the reservoir. Fecal coliform was increasing at stations BZ-5, -6, and -7 in the spring and decreasing at BZ-3 in the summer.

4.4 DRINKING WATER MONITORING

Drinking water from the public fountain located in the overlook building of Beltzville Reservoir was in compliance with most water quality standards in 2001. Repeated tests for Coliform presence in the drinking water was out of compliance in the early half of the summer; however, upon installation of a chlorination system into the water supply, coliform was absent in subsequent drinking water monitoring tests.